

Appl. No. 10/643,115
Examiner: NGUYEN, DILINH P, Art Unit 2814
In response to the Office Action dated March 24, 2006

Date: May 18, 2006
Attorney Docket No. 10112761

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (Currently amended): A method for controlling ~~[[the]]~~ a top width of a trench, comprising the steps of:

- providing a substrate, having a trench formed therein;
- forming a conductive layer in a portion of the trench;
- forming an interval layer in a portion of the trench, wherein the interval layer is formed over the conductive layer;
- forming a sacrificial layer on ~~[[the]]~~ a sidewall of a top portion of the trench and on the interval layer;
- etching the sacrificial layer to remove a portion of the sacrificial layer on the interval layer;
- removing the interval layer to expose ~~[[the]]~~ a sidewall of a portion of the trench ~~between the remaining~~ which is uncovered by the sacrificial layer and the conductive layer; and
- oxidizing the sacrificial layer and the exposed sidewall of the trench to form a first silicon oxide layer.

Claim 2 (Original): The method according to claim 1, wherein the substrate is a single crystal silicon substrate.

Claim 3 (Currently amended): The method according to claim 1, wherein the step of forming the conductive layer further comprises depositing the conductive layer over the substrate and in the trench and etching back the conductive layer, which in ~~[[the]]~~ a top of the recessed conductive layer is below ~~[[the]]~~ a surface of the substrate.

Claim 4 (Original): The method according to claim 1, wherein the conductive layer is formed of polysilicon.

Appl. No. 10/643,115
Examiner: NGUYEN, DILINH P, Art Unit 2814
In response to the Office Action dated March 24, 2006

Date: May 18, 2006
Attorney Docket No. 10112761

Claim 5 (Original): The method according to claim 1, wherein the trench further comprises a capacitor.

Claim 6 (Original): The method according to claim 1, wherein the interval layer is formed of TEOS.

Claim 7 (Currently amended): The method according to claim 1, wherein the steps of forming the interval layer further comprises depositing the interval layer on the substrate and in the trench and etching back the interval layer, wherein the a top of the interval layer is below the a surface of the substrate.

Claim 8 (Canceled)

Claim 9 (Original): The method according to claim 1, wherein the sacrificial layer is formed of polysilicon.

Claim 10 (Currently amended): The method according to claim 1, wherein the a depth of the trench is between 5000nm~9000nm.

Claims 11~20 (Canceled)

Claim 21 (Currently Amended): A method for controlling the an upper width of a trench, comprising:

- providing a substrate, further comprising a trench;
- forming a conductive layer in a portion of the trench;
- forming an interval layer in a portion of the trench, where in the interval layer is over the conductive layer;
- forming a protective layer on the a sidewall of the trench over the interval layer;
- removing the interval layer, exposing the a sidewall of the trench over the conductive layer;

Appl. No. 10/643,115

Examiner: NGUYEN, DILINH P, Art Unit 2814

In response to the Office Action dated March 24, 2006

Date: May 18, 2006

Attorney Docket No. 10112761

oxidizing the trench sidewall, wherein ~~[[the]]~~ a top portion of the trench is protected by the protective layer from oxidizing to form a first silicon oxide layer on the exposed sidewall of the trench and the protective layer;

forming a second silicon oxide layer on the first silicon oxide layer, wherein the first and second oxide layers acting as collar dielectric layer;

depositing ~~[[a]]~~ an upper conductive layer on the second silicon oxide layer;

recessing the second silicon oxide layer; and

etching the collar dielectric layer to expose a portion of the upper conductive layer adjacent to the sidewall of the trench.

Claim 22 (Canceled)